



## Shoulder-fired missiles: A concern to U.S. aviation

By Mimi Hall, USA TODAY

WASHINGTON — The news out of Kenya shook U.S. aviation and homeland security officials on Thanksgiving a year ago: Terrorists believed to have links to al-Qaeda had fired two Russian-made, SA-7 missiles at a jet packed with Israeli tourists taking off from the resort town of Mombasa.



Nicaraguan soldiers carry SA-7 shoulder-fired missiles during a parade in Managua.

By Miguel Alvarez, AFP/Getty Images

The terrorists missed their target. But the attack was a chilling reminder that it may be only a matter of time before lightweight portable missiles, long a staple of Hollywood action movies and a threat to military aircraft in hostile lands, are used against American passenger planes. Rep. Steve Israel, D-N.Y., calls it "a catastrophe waiting to happen."

But despite the potential for an attack that could kill hundreds and cripple the economy, passengers shouldn't expect to ride on protected planes any time soon. If ever. (**Related graphic:** [How shoulder-fired missiles work](#))

"This is a serious and complex issue with no easy solution," says Parney Albright, the Homeland Security Department's science and technology chief. He's in charge of a two-year, \$100 million program to explore whether anti-missile devices used on military aircraft should be installed on the nation's 5,500 commercial passenger jets.

The biggest obstacle may be the price tag. Government officials estimate it could cost \$1 million to \$3 million per plane to install the equipment; some industry estimates are 10 times higher. Either way, it would be the most expensive security upgrade ever ordered for the nation's commercial passenger fleet. And those estimates don't include maintenance costs, which could run as high as \$10 billion a year for the fleet.

Homeland Security Department officials also express concern about the equipment itself. One system that uses lasers against heat-seeking missiles is prone to frequent breakdowns. Another that sends decoy flares out the back of a plane could cause ground fires. Because of the potential to waste money on equipment that doesn't always work, officials say it's important to take time to study and test the systems.

But some members of Congress are nervous. Sen. Barbara Boxer, D-Calif., says the nation can't afford to wait until 2006 for a decision. Intelligence officials estimate that as many as 150,000 of the world's roughly 500,000 portable shoulder-fired missiles are in the hands of at least 27 terrorist or guerrilla groups, including al-Qaeda.

Says Boxer: "The time to do something was yesterday."

Since the Mombasa incident, other headlines have prompted calls for action. On Nov. 22, a civilian DHL cargo plane was hit with a shoulder-fired missile after taking off from Baghdad International Airport.

The plane's wing caught fire, but it landed safely and no one was hurt. Last month, Iraqi guerrillas used shoulder-fired missiles to shoot down a Chinook transport helicopter outside Baghdad, killing 16 American soldiers and wounding 20 more. And in August, FBI agents in New Jersey arrested an arms dealer trying to sell an SA-7 missile to an agent posing as a Muslim extremist.

"It's been two years since 9/11, it's been one year since the Israeli airliner was shot at and a few days since we lost 16 (soldiers) in the Chinook helicopter," Boxer says. "If (Bush administration officials) can't see the handwriting on the wall, they're just turning away from it. This thing is coming at us."

Many authorities say they're surprised terrorists haven't yet tried to use a missile to down an American airliner, here or abroad.

A shoulder-fired missile — often called MANPADS, for Man Portable Air Defense Systems — can be bought on the black market for as little as a few hundred dollars, slipped into a golf bag, carried into the bushes on the outskirts of an airport and launched in a few seconds. Because most missiles can hit a plane flying as high as 15,000 feet, a terrorist doesn't need to be on airport property to take a shot at takeoff or landing. If a heat-seeking missile worked as it should and was properly aimed at a plane's engine, it would lock on to the target with an infrared sensor and explode on contact.

As the DHL attack showed, planes can survive missile attacks. And experts point out that jets are built to withstand the loss of an engine in flight.

"The vulnerability of commercial aircraft is a big unknown," Albright says. "We know in some cases a strike would not be catastrophic. But you can't count on (a missile) hitting a place where damage would not be catastrophic."

Of the five previous attacks on large turbojet airliners, two resulted in crashes that killed everyone onboard, two caused significant damage but no fatalities, and one (the Mombasa attempt) missed the plane.

Intelligence and homeland security officials view the Mombasa attack as the most significant because it was the first time terrorists attacked a plane outside a war zone to make a political statement.

Boxer charges that the administration is "slow-walking" the research process because officials don't want the government to pay for anti-missile technology and the struggling airline industry can't afford it. But she and others warn that the cost of even a failed attack on an American airliner would be staggering.

"It would be the absolute end of the aviation industry as we know it," Israel says. "I can't think of many Americans who would want to get on a plane knowing a shoulder-fired missile even came close to hitting one."

Rep. John Mica, R-Fla., chairman of a House subcommittee on aviation, calls the threat a "national security issue."

### **But will it work?**

In the face of demands for fast action, Homeland Security Department officials say that there is no credible, specific intelligence about any terrorist plot to attack commercial planes in the United States with shoulder-fired missiles. They say their program to encourage companies to improve the technology is critical, so that the government doesn't waste billions of dollars that could be better spent on security elsewhere.

The companies that make the devices, which stand to reap huge profits if the government buys from them, insist the systems will work on passenger jets. But airline manufacturers, aviation experts and pilots' groups are skeptical about the technology and concerned about costs.

Says Doug Wills of the Air Transport Association, which represents airlines: "We take the threat very seriously. But there are no silver bullets here."

The systems that are being studied by the Homeland Security Department fall into three categories. Two of them — laser-based jammers and flares — are attached to the airplane and designed to cause missiles to veer off course. The third does the same thing, but the flares are sent up from the ground.

The jammer systems use lasers to send signals to the heat-seeking head of the missile. The signals cause the missile to lose its "lock" on the plane's engine.

These systems, used on some military aircraft and head-of-state planes (including, reportedly, Air Force One), involve installing a pod onto the belly of a plane. The pod houses a swiveling turret for the laser jammers and a missile warning system that activates them.

Defense contractor Northrop Grumman, which makes jammers for military aircraft, has submitted a proposal to the Homeland Security Department as part of the two-year review. Company officials say it would cost \$1 million to \$2 million per plane to install.

"We have the system ready," Northrop's Robert Del Boca says. "We can do this." On a commercial jet, he says, it would be installed in a canoe-shaped pod under the plane measuring 5 feet long, 18 inches wide and a foot deep.

Homeland security officials view laser-based jamming systems as the most promising solution for passenger planes. But they have qualms about the cost and say the systems are not trouble-free. The swiveling turrets, for example, are sensitive to temperature changes and prone to breaking after a few hundred hours of use, officials say.

### **High costs, low reliability**

A recent Congressional Research Service report assessing countermeasures says the laser-based systems may be the most effective. Their "weight, size, cost and reliability, however, may not yet make them attractive for commercial airlines," the report says.

A high-level official at one airline-manufacturing firm recently estimated it would cost \$100 billion — 10 times government and congressional estimates — to equip the nation's commercial jets. It would cost twice as much, the official said, to equip the smaller propeller planes and jets that are increasingly popular with the airlines.

Another solution could come in the form of fast-burning decoy flares that are shot out of a plane when a sensor detects an incoming missile. The flares, also reportedly used on Air Force One, are designed to lure the missile into going after a different heat source than the plane's engine.

Tom Wilson of ATK, a defense contractor that has sold flares to the military, says his company can put them on commercial planes for \$500,000 per plane. The flare system, he says, can be installed in a way that makes it flush with the plane's fuselage. That would eliminate drag and the resulting higher fuel costs for airlines.

In Israel, El Al recently started installing a flare system on its small fleet of planes. But U.S. officials say flares may not be practical here.

First, they would require airlines to train workers at every airport in the country to properly handle, store and load pyrotechnics onto planes. Second, critics say some modern missiles aren't fooled by flares. Third, the sensors that cause flares to deploy are prone to "false positives"; they may signal a pending attack when they pick up a glint off a windshield or a lake. Officials worry that if people on the ground began to see planes shooting out flares too often, it would create a public-relations problem for the aviation and travel industries.

### **A fire hazard?**

Wilson says his company's flares burn out fast and don't pose any risk to people on the ground. But "most flares pose a fire hazard to combustibles on the ground and may be too risky for urban areas," according to the

Congressional Research Service report.

The idea that planes would shoot flares near a populated place such as Washington's Reagan National Airport "is laughable," says John Pike of GlobalSecurity.org, a defense think tank. "That strikes me as a good way to burn down Old Town Alexandria," a nearby Virginia suburb. Officials say a ground-based system that would be deployed around all U.S. airports would be the least expensive option, but also the least effective. It would involve installing and maintaining dozens of 100-foot poles equipped with sensors and flares at every airport.

But the U.S. government couldn't force overseas airports to install such systems. And that would leave American passenger planes vulnerable abroad, where intelligence officials say the threat of shoulder-fired missiles is highest.

Despite the concerns, Albright says that finding a way to counter the threat from shoulder-fired missiles is a government priority. "This has got presidential attention, congressional attention and high-level Department of Homeland Security attention," he says. "We have a sense of mission here."

But in August, Albright's former boss was asked whether he thought it was inevitable that U.S. passenger planes would be equipped with anti-missile technology. "No," replied Gordon England, who has since left his job as the department's deputy secretary. "I don't think it's inevitable."

*Contributing: Alan Levin*

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